

MICROBIAL DETERMINANTS OF VIRULENCE AND HOST RESPONSE

Editor: Elia M. Ayoub

Coeditor: Gail H. Cassell

Associate Editors: William C. Branche, Jr., and Timothy J. Henry

THE PROLIFERATION of information on the molecular microbiology of factors involved in microbial virulence prompted this comprehensive new publication. Essentially a survey and evaluation of the current status of research in the related fields of bacteriology, mycology, immunology, and host-parasite relationships, the book offers readers a useful summary of recent advances. Based on a workshop held under the auspices of the Bacteriology and Mycology Study Section of the Division of Research Grants and the National Institute of Allergy and Infectious Diseases, the book contains the following sections and chapters:

I. Bacterial Factors

1. Regulation of Post-Exponential-Phase Exoprotein Synthesis in *Staphylococcus aureus* (Novick et al.); 2. Streptococcal Immunoglobulin-Binding Proteins (Boyle et al.); 3. Noncapsular Surface Antigens and Their Association with Virulence of *Haemophilus influenzae* Type b (Hansen); 4. Reappraisal of the Chemistry of Mycobacterial Cell Walls, with a View to Understanding the Roles of Individual Entities in Disease Processes (Brennan et al.); 5. Regulation of the Immune Response to *Mycobacterium tuberculosis* (Ellner et al.); 6. Role of Major Histocompatibility Complex (MHC) and Non-MHC Genes in Host Resistance and Susceptibility to Mycobacteria (Buschman et al.); 7. Role of the Capsular Polysaccharide of Type III Group B Streptococci in Virulence (Kasper et al.).

II. Fungal Factors

8. Immunobiology of *Histoplasma capsulatum*-Reactive T Cells (Deepe); 9. Gamma Interferon and Experimental Murine Histoplasmosis (Wu-Hsieh and Howard); 10. Macrophage Oxidation of L-Arginine Is Linked to Fungistatic Capability (Granger et al.); 11. *Candida albicans* Acid Proteinase: a Role in Virulence (Ray and Payne); 12. Adherence of *Candida albicans* to Mammalian Cells (Edwards and Mayer).

III. Bacterial Factors in Sexually Transmitted Diseases

13. Pilus and Outer Membrane Protein II Variation in *Neisseria gonorrhoeae* (Swanson); 14. Outer Membrane Proteins of *Neisseria gonorrhoeae* (Elkins and Sparling); 15. Cellular and Molecular Pathogenesis of Syphilis (Blanco et al.); 16. Chlamydial 57-Kilodalton Stress Response Protein Is a Deleterious Immune Target (Morrison).

IV. Biologic Factors

17. The Neutrophil NADPH Oxidase System: Molecular Aspects (Clark); 18. Lipopolysaccharide Signal Modification by Acyloxyacyl Hydrolase, a Leukocyte Enzyme (Munford et al.); 19. Regulation of Macrophage-Mediated Antigen Presentation by Microbial Products (Ziegler); 20. Complement in Host Defense against Bacterial Infections (Frank).

V. Antibiotic Resistance

21. Antibiotic Resistance in *Haemophilus influenzae* (Smith); 22. New and Complex Strategies of β -Lactam Antibiotic Resistance in Pneumococci and Staphylococci (Tomasz); 23. Evolving β -Lactamases (Jacoby); 24. Multiple Antibiotic Resistance: Gene Selection, Function, and Spread (Levy).

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ESCHERICHIA COLI LINKAGE MAP

Call for reprints

The 1990 *Escherichia coli* linkage map, edition 8 (Microbiol. Rev. 54:130-197, 1990), was 2 years out of date at the time of publication. One of the major problems in revising the map is that of obtaining copies of all the papers containing mapping data. While edition 8 was being prepared, the Yale University science libraries cancelled their subscriptions to many journals, and they cannot afford to subscribe to many new ones. It would be immensely helpful if authors of papers containing mapping data of any sort would send to me reprints of their papers from all journals other than the *Journal of Bacteriology*. This might permit publication of map revisions in a more timely fashion.

Barbara J. Bachmann
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OML 355
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New Haven, CT 06511-7444

E. COLI WALL MAP AVAILABLE

A limited supply of the following will be available from ASM: reprints of the article "Linkage Map of *Escherichia coli* K-12, Edition 8," by Barbara J. Bachmann (Microbiol. Rev. 54:130-197, 1990) and wall charts (ca. 21 × 24½") of the *E. coli* linkage map. Shipped together in a mailing tube. \$10.50, U.S. and Canada; \$12.50, foreign (surface).

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PHYSICAL AND GENETIC MAP OF ESCHERICHIA COLI

Call for Contributions

The *Journal of Bacteriology* will publish in brief text or tabular form and on a quarterly basis the physical locations of genes and loci assigned to the *Escherichia coli* chromosome. This information can be presented by the unambiguous identification of a matching restriction pattern or by the assignment of a gene or locus to a particular λ phage from the "Miniset" library. Manuscript should be submitted in duplicate to the ASM Publications Department. All parts must be typed double spaced. Galley proofs will not be sent to the authors, and no page charge(s) will be assessed for these contributions. Reprints will not be available. For a more complete description of these submissions, see the January 1990 issue of *ASM News*, p. 6-7.

COMMON MECHANISMS OF TRANSFORMATION BY SMALL DNA TUMOR VIRUSES

Edited by **Luis P. Villarreal**, *Cancer Research Institute, University of California, Irvine*

Small DNA tumor viruses, i.e., polyomavirus, papillomavirus, and adenovirus, have long been of major interest, primarily because they have been shown to cause cancers. An in-depth examination of their common mechanisms of cell transformation is the focus of this volume, arising from the 1989 ICN-UCI International Conference on Virology.

November 1989
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ADP-Ribosylating Toxins and G Proteins

Insights into Signal Transduction

Edited by **Joel Moss** and **Martha Vaughan**, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland

The contents of this important synthesis and the expert contributors span the disciplines of microbiology, biochemistry, molecular biology, and pharmacology to review current knowledge about ADP-ribosylating toxins, guanine nucleotide-binding proteins, receptors, and signal transduction. Recombinant DNA technology has been applied to elucidate the molecular basis of action of these bacterial toxins, which are responsible in part for the syndromes characteristic of a number of infectious diseases.

The contents are in three main sections: I. Bacterial ADP Ribosyltransferases: Toxins and Related Proteins (9 chapters); II. Guanine Nucleotide-Binding Proteins Coupled to Signal Transduction in Animal Cells (13 chapters); and III. ADP Ribosylation in Bacteria and Animal Cells (6 chapters).

This book will very effectively update interested scientists and students on the current status of research into ADP-ribosylating toxins and related topics and will point the way for future advances.

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March 1990

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*The first book to focus specifically
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eucaryotes. . . .*

CALCIUM AS AN INTRACELLULAR MESSENGER IN EUCARYOTIC MICROBES

Edited by **Danton H. O'Day**, *Erindale College,
University of Toronto,
Mississauga, Ontario, Canada*

The 22 chapters in this unique work, by over 40 authors, review current research on the role of calcium in the cellular functions of over 15 eucaryotic microorganisms of great recent interest. The ways calcium levels are regulated and how calcium can serve as an intracellular signal are closely examined.

General topics include the regulation of calcium levels via signal transduction involving inositol phosphates, the movement of calcium across the cell membrane, the intracellular storage sites for calcium, calcium oscillations, calcium-mediated enzyme activities, and calcium-binding proteins. The roles of calcium in cell growth, division, fusion, differentiation, movement, shape, contractility, chemotaxis, circadian rhythms, mating, morphogenesis, and secretion are detailed.

The primary intended audience includes cell biologists, physiologists, and biochemists studying signalling and transduction; researchers focusing on intracellular regulation and the role of calcium; and other scientists interested in eucaryotic microbes, signalling, and transduction. Because each chapter begins with a general review which progresses to the authors' current research and culminates in an assessment of future directions, graduate and undergraduate students will also find the information very accessible.

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A significant update on signalling processes in immunoregulation LIGANDS, RECEPTORS, AND SIGNAL TRANSDUCTION IN REGULATION OF LYMPHOCYTE FUNCTION

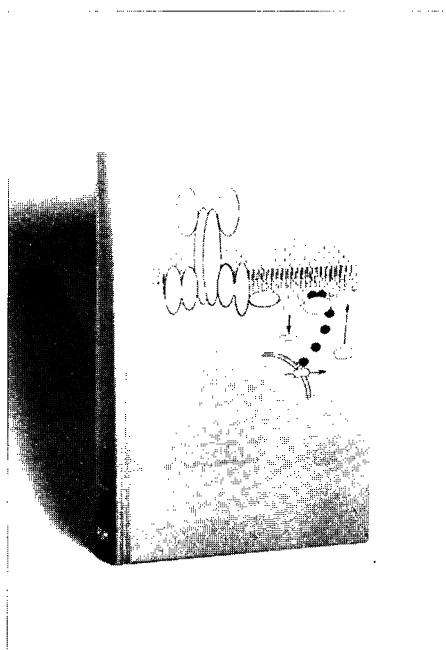
Edited by John C. Cambier

THE ROLE of the physiologic ligands, including immunogens, major histocompatibility complex class I and class II molecule-associated peptides, and lymphoid cell-associated ligands, has been the focus of intense research over the last decade. Immunologists concur that one necessary precursor to intelligent therapeutic intervention in immunologic diseases is a full understanding of the means by which these ligands and their receptors engage in the transduction of signals across the plasma membrane, with subsequent alteration of gene expression.

This book provides a comprehensive update of the current state of knowledge about the molecular basis of the intervening events between receptor-ligand interaction and biologic responses. The chapters addressing antigen, interleukin-2, and interleukin-1 receptors provide relatively complete descriptions of their operative processes, while the chapters on B-cell regulatory lymphokines reflect the more limited current knowledge of the processes. The book also addresses the phenomenon of cross-modulation of signalling and the ability of members of the family of "cluster of differentiation" antigens to act as signal transducers.

Researchers, postdoctoral fellows, and graduate students in the fields of immunology and cell biology will

find this discussion of the signalling processes operative in physiologic regulation of lymphocytes useful both as a summary of present knowledge and as a roadmap for future research.



CONTRIBUTORS:

Thomas Barrett, Stephen H. Benedict, Anna T. Brini, John C. Cambier, Kerry S. Campbell, Marcia A. Chan, Marcio Chedid, Edward A. Clark, William L. Farrar, Terri H. Finkel, Erwin W. Gelfand, Lisa K. Gilliland, Angelika Grossmann, Louis B. Justement, David J. Kelvin, Ralph T. Kubo, Peter J. L. Lane, Jeffrey A. Ledbetter, Diana Linnekin, Peter E. Lipsky, Fiona McConnell, Kathryn E. Meier, Dennis F. Michiel, Steven B. Mizel, John G. Monroe, Peter S. Rabinovitch, Neal Roehm, Vicki L. Seyfert, Fumihiko Shirakawa, E. Charles Snow, Judy B. Splawski, Mary A. Valentine.

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Pseudomonas

BIOTRANSFORMATIONS, PATHOGENESIS, AND EVOLVING BIOTECHNOLOGY

Edited by **Simon Silver** and **Ananda M. Chakrabarty**, *University of Illinois College of Medicine, Chicago*; **Barbara Iglewski**, *University of Rochester, Rochester, New York*; and **Samuel Kaplan**, *University of Texas Medical School, Houston*

Scientific interest in the genus *Pseudomonas* is now as multifaceted as the organisms themselves. Pseudomonads are variously pathogens of plants and animals, including humans; producers of siderophores which are beneficial to plants; natural scavengers whose activity results in biodegradation and removal of many natural and synthetic compounds; extremely useful systems for the study of metabolic pathways, gene structure, and gene expression; and producers of interesting industrial products. Because *Pseudomonas* species are so extremely important, there has been an explosive growth in research and information during the past several years, and state-of-the-art research methods are being applied to their fullest potential in these investigations.

All major aspects of *Pseudomonas* research, as well as investigations of several closely related bacteria, are encompassed in this review of the field, which had its origins in the third international symposium, "Pseudomonas 89," held in Chicago, Ill. Included are reviews of biochemical, biophysical, genetic, and molecular studies. What emerges is a true reflection of the extraordinary amount and types of available information on this important genus.

CONDENSED CONTENTS

Preface (Silver)

Introduction (Silver and Chakrabarty)

I. Pathogenesis (4 chapters by Vasil et al., Zielinski et al., Ohman et al., and Iglewski et al.)

II. Plant-Bacterial Interactions (6 chapters by Mills and Mukhopadhyay, Chatterjee et al., Weisbeek et al., Mindrinos et al., Schott et al., and Keller et al.)

III. Biotransformations (12 chapters by Davies et al., Furukawa et al., Gibson et al., Nakazawa et al., Witholt et al., Rodwell et al., Davison et al., Schell, Burns et al., Schlömann et al., Spain, and Ornston et al.)

IV. Plasmids, Vectors, Gene Mapping, and Cloning (7 chapters by Morales et al., Davison et al., Miller et al., Holloway et al., Lessie et al., Chang et al., and Haas et al.)

V. Cell Envelope and Transport (5 chapters by Trias and Nikaido, Siehnel et al., Paranchych et al., Sano et al., and Cervantes and Silver)

VI. Honorary Pseudomonads (4 chapters by Penfold and Pemberton, Neilands, Kaplan and Suwanto, and Friedrich et al.)

Hardcover (ISBN 1-55581-019-5) - April 1990
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In two volumes, the current "last word" on bacterial nomenclature from *Acetobacter* to *Zymomonas*....

APPROVED LISTS OF BACTERIAL NAMES

(Amended Edition)

**V. B. D. Skerman, Vicki McGowan,
and P. H. A. Sneath**

and

INDEX OF THE BACTERIAL AND YEAST NOMENCLATURAL CHANGES

Published in the *International Journal of Systematic Bacteriology* since the
1980 *Approved Lists of Bacterial Names* (1 January 1980 to 1 January 1989)

W. E. C. Moore and Lillian V. H. Moore

ORIGINALLY PUBLISHED in 1980 in the *International Journal of Systematic Bacteriology*, the *Approved Lists of Bacterial Names* includes all valid names of bacteria which, through 1979, had been adequately described and, if cultivable, for which there was a type, neotype, or reference strain available. It has been reproduced in hardcover with minor corrections and a more "user friendly" format. The *Index of the Bacterial and Yeast Nomenclatural Changes* is a new softcover adjunct volume to the *Approved Lists*, which provides a complete and orderly compilation of nomenclatural changes that have occurred from 1 January 1980 through 1 January 1989. These complementary volumes are not sold separately; they are available only as a set.

Every reference collection serving the life sciences should include this set.

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THE BACTERIAL CHROMOSOME

Edited by **Monica Riley**, *Marine Biological Laboratory, Woods Hole, Massachusetts*, and **Karl Drlica**, *Public Health Research Institute and New York University School of Medicine, New York, New York*

This unique volume reviews current research at the forefront of investigation into the structure and function of the bacterial chromosome, summarizes the foundations of this research in previous work, and provides insights into future trends and directions. The need for such a compilation became apparent to many leading experts who assembled at a 1988 ASM conference. From there, the project soon expanded into an ambitious review encompassing perspectives ranging from bacterial genetics through molecular biology, biochemistry, and microbiology and including such useful features as detailed structural models and up-to-date genetic maps.

The 39 chapters represent the ongoing work in nearly as many leading laboratories and include an intro-

ductory chapter by the editors which recounts the historical developments leading to the present state of our knowledge and which serves to integrate the diverse approaches of the contributors. The result is an eminently useful book that will be appreciated by both scientists and graduate students.

Hardcover (ISBN 1-55581-018-7)
February 1990
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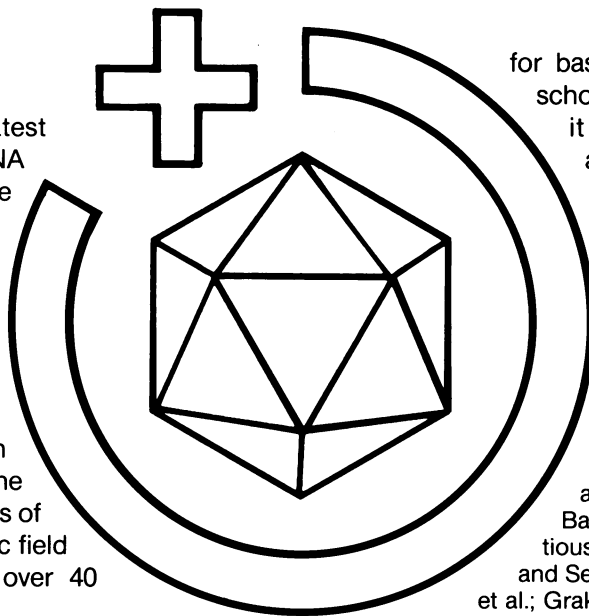
THE LATEST INFORMATION ON SOME VIRUS "SUPERFAMILIES"— NEW ASPECTS OF POSITIVE-STRAND RNA VIRUSES

EDITED BY MARGO A. BRINTON
AND FRANZ X. HEINZ

THIS BOOK presents the latest thinking on positive-strand RNA viruses. These include the majority of plant viruses, insect viruses, and animal viruses, including picornavirus, coronavirus, togavirus, flavivirus, poliovirus, and rhinovirus. Arising from the 2nd International Symposium on Positive-Strand RNA Viruses, held in Vienna, Austria, in June 1989, the book is a compendium of reviews of exciting research in this dynamic field currently being performed at over 40 laboratories.

At one time considered divergent in structure, the viruses of the sindbis, polio, and coronavirus superfamilies are increasingly known to share important similarities which allow them to shuffle conserved amino acid units to form new viruses. The implications for plant, animal, and human viral studies, including vaccine and antiviral-compound development, are serious. In addition, the book gives new insight into the diversity of the structure of picornaviruses. The first animal viruses to be crystallized, the picornaviruses have had enormous influence on subsequent discussions of viral structure. Several color plates illustrate the structural projections of these viruses and add to the book's overall usefulness.

The book will be valued both as an update for virologists, molecular biologists, viral immunologists, medical virologists, and researchers in vaccine development and antiviral compounds and as supplemental reading



for basic virology courses in medical schools and universities. In addition, it is highly recommended for advanced courses in positive-strand RNA virology.

Condensed Contents

Overview: Positive-Stranded RNA Viruses: Early History and the Role of Model Viruses (Kaesberg)

I. Viral Evolution (7 chapters by Goldbach; Spaan et al.; Taylor et al.; Meyers et al.; Dolja et al.; Godeny et al.; and Wright and Cotton.) **II. Genome Replication** (5 chapters by Hall et al.; Flanagan et al.; Strauss et al.; Leibowitz et al.; and Barton et al.) **III. DI-RNAs and Infectious Clones** (7 chapters by Giachetti and Semler; Hagino-Yamagishi et al.; Siegl et al.; Grakoui et al.; Wellink et al.; Morris and Knorr; and Roos et al.) **IV. Protein Translation, Cleavage, and Modification** (10 chapters by Reuer et al.; Howell et al.; Macejak et al.; Simons et al.; Garoff et al.; Parks et al.; Skern et al.; Falk et al.; Feng et al.; and Falgout and Lai.) **V. Virion Structure and Assembly** (6 chapters by Hogle et al.; Acharya et al.; Chen et al.; Wengler; Schlesinger et al.; and Kirkegaard and Compton.) **VI. Viral Receptors, Uptake, and Disassembly** (6 chapters by Holmes et al.; Colonno et al.; McClelland and Greve; Merluzzi et al.; Hsu et al.; and Racaniello et al.) **VII. Antigenic Structure and Functions** (4 chapters by Siddell et al.; Heinz et al.; Kurane et al.; and Strauss et al.) **VIII. Molecular Aspects of Pathogenesis and Virulence** (5 chapters by Agol; Girard et al.; Calenoff et al.; Johnston et al.; and Kandolf et al.) **IX. Strategies for Control of Virus Disease** (4 chapters by Baulcombe et al.; Kew et al.; McKinlay et al.; and Andries et al.)

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An elegant view of a complex macromolecule . . .

THE RIBOSOME

STRUCTURE, FUNCTION, & EVOLUTION

Edited by **Walter E. Hill**, *University of Montana, Missoula*; **Albert Dahlberg**, *Brown University, Providence, R.I.*; **Roger A. Garrett**, *University of Copenhagen, Copenhagen, Denmark*; **Peter B. Moore**, *Yale University, New Haven, Conn.*; **David Schlessinger**, *Washington University School of Medicine, St. Louis, Mo.*; and **Jonathan R. Warner**, *Albert Einstein College of Medicine, Bronx, N.Y.*

This comprehensive overview is a major new addition to literature on the ribosome, covering the structure, function, and evolution of this complex macromolecule in both prokaryotic and eukaryotic systems. The authors, an international group of leading experts representing 13 countries, have written and illustrated their chapters for use by all life scientists, including those outside the field.

The book opens with a personal, historical retrospective and summary by Masayasu Nomura, followed by historical insights on ribosome preparation by Alexander S. Spirin. From there, chapters turn to recent developments in every arena of research into the ribosome. Much of the current knowledge about the detailed mechanisms by which the ribosome is involved in protein biosynthesis has only recently been delineated thanks to a host of new research techniques. Additional information about how antibiotics and ribosomes interact and a view of the ribosome in its evolutionary context are also included.

Arising from the August 1989 International Conference on Ribosomes, this reference will be extremely useful to advanced students as well as investigators whose work either directly or indirectly touches on this subject.

CONDENSED CONTENTS

Historical (2 chapters by Nomura and Spirin). **Structure of Ribosomes and rRNA** (12 chapters by Noller et al.; Brimacombe et al.; Frank et al.; Boublik, Mandiyan, and Tumminia; Stöffler-Meilicke and Stöffler; Yonath et al.; Ehresmann et al.; Draper; Egebjerg, Larsen, and Garrett; Oakes et al.; Serdyuk et al.; and Wool et al.). **Probing rRNA** (4 chapters by Raué et al.; Tappich et al.; Cunningham et al.; and Hill et al.). **Initiation** (5 chapters by Van Knippenberg; Hartz, McPheeters, and Gold; Gualerzi et al.; Merrick; and Munroe and Jacobson). **Elongation** (8 chapters by Liljas; Rheinberger et al.; Zimmermann, Thomas, and Wower; Wintermeyer, Lill, and Robertson; Barta, Kuechler, and Steiner; Hardesty, Odom, and Czerwowski; Ehrenberg et al.; and Möller). **Termination** (2 chapters by Tate, Brown, and Kastner and Murgola et al.). **Ribosome Formation** (7 chapters by Nilsson et al.; Pace and Burgin; Srivastava and Schlessinger; Musters et al.; Warner et al.; Gerbi et al.; and Ware and Khanna-Gupta). **Antibiotic Mechanisms and Probes**

(3 chapters by Cundliffe; Cooperman, Weitzmann, and Fernández; and Ballesta and Lazaro). **Translational Fidelity** (6 chapters by Kurland et al.; Dix, Thomas, and Thompson; Weiss et al.; Buckingham et al.; Bogosian et al.; and Culbertson et al.). **Evolution of Ribosomes** (8 chapters by Gouy and Li; Lake; Gray and Schnare; Wittmann-Liebold et al.; Matheson et al.; Finley, Bartel, and Varshavsky; Amils et al.; and Subramanian, Smooker, and Giese).

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